



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,274	03/10/2004	Paul Rich	WLJ.103	9386

7590 12/16/2004  
VOLENTINE FRANCOS, P.L.L.C.  
Suite 150  
12200 Sunrise Valley Drive  
Reston, VA 20191

EXAMINER
----------

ESTRADA, MICHELLE

ART UNIT	PAPER NUMBER
----------	--------------

2823

DATE MAILED: 12/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/796,274

Applicant(s)

RICH ET AL.

Examiner

Michelle Estrada

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9-11 and 15 is/are rejected.
- 7) ☒ Claim(s) 4-8 and 12-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/22/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claims 5, 9-15 are objected to because of the following informalities:

In claim 5, the claim is unclear and confusing. Power does not have units of watt per cm, that is power density. If applicant intends to claim any particular power supplied to the target it should be corrected with the corresponding unit (watts). If applicant intends to claim a target that has a particular power density, it should be clearly recited, because power density is a property and it cannot be supplied.

In claim 9, line 2, "gasses" is misspelled. It should be corrected to --gases--.

In claim 10, line 2, "minimise" is misspelled. It should be corrected to --minimize--.

In claim 11, line 3, it appears that "tungsten/nitride" should be replaced with --tungsten nitride--.

In claim 15, line 1, it appears that --method-- should be inserted after "the".

Appropriate correction is required.

### ***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 8/2/04 have been considered by the examiner.

Art Unit: 2823

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang et al. (4,786,468).

With respect to claim 1, Wang et al. disclose a method of sputtering a tungsten-containing film from a tungsten target (Col. 1, lines 57-59) onto a semiconductor wafer including using krypton as a sputter gas (Col. 1, lines 65-68).

With respect to claim 2, Wang et al. disclose wherein the deposition takes place in a vacuum chamber with a krypton pressure of less than 10 mTorr (Col. 1, lines 62-66).

With respect to claim 3, Wang et al. disclose wherein krypton pressure is about 3 to 4 mTorr, which is less than 6 mTorr (Col. 1, lines 62-66).

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Kitakado et al. (6,709,902).

Art Unit: 2823

With respect to claim 1, Kitakado et al. disclose a method of sputtering a tungsten-containing film from a tungsten target (Col. 14, lines 43-45) onto a semiconductor wafer including using krypton or xenon as a sputter gas (Col. 1, lines 65-68).

With respect to claim 9, Kitakado et al. disclose wherein the sputter gases further include argon (Col. 14, lines 49-53).

With respect to claim 10, Kitakado et al. disclose wherein the ratio of argon to krypton or xenon is selected to minimize stress in the deposited film (Col. 14, lines 50-53).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguwa (6,800,543) in view of Matsumoto et al. (6,451,690).

With respect to claim 11, Taguwa discloses a method of forming a tungsten/tungsten nitride (16/17) stack on a wafer including sputtering a tungsten nitride film (16) on a wafer and sputtering a tungsten film (17) on the tungsten nitride film (Col. 5, lines 1-65).

Art Unit: 2823

Taguwa does not specifically disclose wherein the two sputtering processes are performed in a single chamber using a single target.

Matsumoto et al. disclose a method of forming metal film by sputtering method; wherein the metal films can be continuously formed by using the same target placed in the same chamber by merely changing the kind of gas to be used for the sputtering (Col. 5, lines 33-36).

It would have been within the scope of one of ordinary skill in the art to combine the teachings of Taguwa and Matsumoto et al. to use the same target and chamber in the sputtering processes of Matsumoto et al. to be performed in the process of Taguwa because using the same target placed in the same chamber improves the throughput.

With respect to claim 15; the process of the combination of Taguwa and Matsumoto et al. will produce a gate structure formed by the method of claim 11.

***Allowable Subject Matter***

Claims 4-8 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4-8 and 12-14 would be allowable if rewritten to overcome the Objections, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Art Unit: 2823

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Estrada whose telephone number is 571-272-1858. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2800.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

Art Unit: 2823

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Michelle Estrada".

Michelle Estrada

Examiner

Art Unit 2823

ME

December 10, 2004